AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-20 (Canceled).

21. (Previously Presented) An apparatus for generating electromagnetic radiation, comprising:

a polarizable or magnetizable medium, and

means for generating, in a controlled manner, a polarization or magnetization current or charge distribution having an accelerated motion with a superluminal speed so that the apparatus generates non-spherically decaying electromagnetic radiation.

22. (Previously Presented) An apparatus according to claim 21, wherein the polarizable or magnetizable medium is a dielectric substrate.

23. (Previously Presented) An apparatus according to claim 22, wherein the means for generating the polarization current or charge distribution includes:

an array of electrode pairs positioned opposite to each other along the medium, and

a voltage generator for applying a voltage to the electrodes sequentially at a rate sufficient to induce a polarization current in the medium whose distribution pattern moves along the medium with a speed exceeding the speed of light in vacuo.

24. (Previously Presented) An apparatus according to claim 21, further comprising:

means for modulating an amplitude of the current or charge distribution,

wherein the spectrum of the generated electromagnetic radiation contains frequencies that are higher than frequencies needed for generating the current or charge distribution and its modulations.

25. (Previously Presented) An apparatus according to claim 21, wherein the polarizable or magnetizable medium has the shape of a circle or an arc of the circle.

26. (Previously Presented) An apparatus according to claim 21, wherein the polarizable or magnetizable medium has a rectilinear shape.

27. (Previously Presented) An apparatus according to claim 26, wherein the means for generating includes means for accelerating the current or charge distribution through the speed of light in such a way that an envelope of wave fronts generated by each element of the current or charge distribution possesses a cusp for a period of time.

28. (Previously Presented) A compact polarization synchrotron comprising an apparatus according to claim 24 or claim 25, arranged to generate focused pulses of electromagnetic radiation with high frequencies in a near zone.

29. (Canceled).

30. (Previously Presented) A spectrometer comprising a detector and a source, wherein the source corresponds to the apparatus according to claim 27.

31. (Previously Presented) A spectrometer comprising a detector and a source, wherein the source corresponds to the synchrotron according to claim 28.

32. (Currently Amended) A spectrometer comprising a detector and a source, wherein the source corresponds to the synchrotron according to claim ~~29~~28.

33. (Canceled).

34. (Canceled).

35. (Canceled).

36. (Previously Presented) A broad-band telecommunications antenna comprising an apparatus according to claim 21, for conveying telephonic, visual, or other electronic data over long distances without significant attenuation.

37. (Previously Presented) A broad-band telecommunications antenna comprising an apparatus according to claim 27, further comprising means for controlling the apparatus such that a generated pulse of electromagnetic radiation is focussed at a specific region of interest, distant from the antenna, for a specific period of time.

38. (Previously Presented) A network of antennae according to claim 36, arranged to expand the effective bandwidth of free space for terrestrial electromagnetic broadcasts and communications.

39. (Previously Presented) A network of antennae according to claim 37, arranged to expand the effective bandwidth of free space for terrestrial electromagnetic broadcasts and communications.

40. (Previously Presented) A compact aerial according to claim 36 to be used for hand-held portable phones.

41. (Previously Presented) A compact aerial according to claim 37 to be used for hand-held portable phones.

42. (Previously Presented) A compact aerial according to claim 38 to be used for hand-held portable phones.

43. (Previously Presented) A compact aerial according to claim 39 to be used for hand-held portable phones.

44. (Previously Presented) An apparatus according to claim 27, further comprising a means for controlling the apparatus such that a generated pulse of electromagnetic radiation is focused at a specific region for a specific period of time.

45. (Canceled).

46. (Canceled).

47. (Canceled).

48. (Canceled).

49. (Canceled).

50. (Previously Presented) A compact aerial according to claim 37, used for television communications.

51. (Previously Presented) A compact aerial according to claim 38, used for television communications.

52. (Previously Presented) A compact aerial according to claim 39, used for television communications.

53. (Previously Presented) A compact aerial according to claims 37, used for Internet communications.

54. (Previously Presented) A compact aerial according to claims 38, used for Internet communications.

55. (Previously Presented) A compact aerial according to claims 39, used for Internet communications.

56. (Previously Presented) An apparatus according to claim 22, wherein the means for generating the current or charge distribution generates a current or charge distribution that generates a spherically decaying component of electromagnetic radiation.

57. (Previously Presented) An apparatus according to claim 52, wherein the means for generating the current or charge distribution generates a current or charge distribution that generates a focused beam without a phased array antenna.

58. (Previously Presented) An apparatus according to claim 23, wherein the distribution is controlled by a shape of the medium or varying the applied voltage with respect to time.

59. (Previously Presented) An apparatus according to claim 21, wherein the distribution is a volume distribution.

60. (Previously Presented) An apparatus according to claim 21, wherein the intensity of the non-spherically decaying component decays at a rate of $1/R^x$, where R is a distance from the distribution and x is less than 2.

61. (Previously Presented) A method for generating electromagnetic radiation, comprising:

providing a polarizable or magnetizable medium; and

generating a current or charge distribution using the polarizable or magnetizable medium,

wherein the current or charge distribution has an accelerated motion with a superluminal speed which produces non-spherically decaying electromagnetic radiation.

62. (Previously Presented) The method in claim 61, wherein the current or charge distribution produces spherically decaying electromagnetic radiation.

63. (Previously Presented) The method in claim 61, further comprising:

modulating an amplitude of the distribution current or charge distribution,

wherein a spectrum of the generated electromagnetic radiation contains higher frequencies than the frequencies needed for the generation of the current or charge distribution and its modulations.

64. (Previously Presented) The method in claim 61, further comprising:

changing the speed of the current or charge distribution, the acceleration of the distribution, or an amplitude of the current or charge distribution to control one or more characteristics of the electromagnetic radiation.

65. (Previously Presented) A method according to claim 61, further comprising:

accelerating the current or charge distribution through the speed of light so that an envelope of wave fronts generated by each of multiple volume elements of the current or charge distribution possesses a cusp for a period of time.

66. (Previously Presented) A method according to claim 61, further comprising:

generating intense, focused pulses of electromagnetic radiation with high frequencies in a near zone.

67. (Previously Presented) A method according to claim 61, further comprising:

using the electromagnetic radiation for spectroscopy.

68. (Currently Amended) A method according to claim 61, further comprising:

using the electromagnetic radiation to convey information over ~~long~~ distances ~~without significant attenuation~~with an attenuation lower than a distance defined by an inverse square law.

69. (Previously Presented) A method according to claim 61, further comprising:

using the electromagnetic radiation for portable communications.

70. (Previously Presented) A method according to claim 61, further comprising:

using the electromagnetic radiation for Internet communications.

71. (Previously Presented) A method according to claim 61, further comprising:

using the electromagnetic radiation for television communications.

72. (Previously Presented) An apparatus for generating electromagnetic radiation, comprising:

a polarizable or magnetizable medium, and

a generator for creating a charge or current distribution using the polarizable or magnetizable medium,

wherein the charge or current distribution generates electromagnetic radiation whose intensity attenuates at a rate of $1/R^x$ in a far field, where R is a distance from the current or charge distribution and x is less than 2.

73. (Previously Presented) An apparatus according to claim 72, wherein the medium is a dielectric substrate.

74. (Previously Presented) An apparatus according to claim 72, wherein the generator includes:

an array of electrode pairs positioned opposite each other along the medium, and

a voltage source for sequentially applying a voltage to the electrodes at a rate sufficient to induce a polarization current whose charge or current distribution moves along the medium with a speed exceeding the speed of light in vacuo.

75. (Previously Presented) An apparatus according to claim 72, further comprising:

a modulator for modulating an amplitude of the charge or current distribution,

wherein a spectrum of the electromagnetic radiation contains frequencies greater than the frequencies needed for the generation of the current or charge distribution and its modulations.

76. (Previously Presented) An apparatus according to claim 72, wherein the medium has the shape of a circle or an arc of a circle.

77. (Previously Presented) An apparatus according to claim 72, wherein the medium has a rectilinear shape.

78. (Previously Presented) An apparatus according to claim 72, wherein the distribution is accelerated through the speed of light so that the envelope of wave fronts generated by each of multiple volume elements of the charge or current distribution possesses a cusp for a period of time.

79. (Previously Presented) A compact polarization synchrotron comprising an apparatus according to claim 72, arranged to generate focused pulses of electromagnetic radiation with high frequencies in a near field, wherein the near field is a distance from the charge or current distribution less than a Fresnel distance.

80. (Previously Presented) An apparatus according to claim 72, wherein the far field is a distance from the charge or current distribution greater than a Fresnel distance.